FINAL
FIELD SAMPLING PLAN

SHAFFER EQUIPMENT CO
MINDEN, FAYETTE COUNTY
WEST VIRGINIA

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LIST OF ACRONYMS AND ABBREVIATIONS

ATV	all-terrain vehicle
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CLP	EPA Contract Laboratory Program
EDD	electronic data deliverable
EPA	U.S. Environmental Protection Agency
ESAT	Environmental Services Assistance Team
ESI	Expanded Site Inspection
FSP	Field Sampling Plan
GPS	Global Positioning System
HRS	Hazard Ranking System
IATA	International Air Transport Association
IDW	investigation-derived waste
MS/MSD	matrix spike and matrix spike duplicate
NPL	National Priorities List
OASQA	EPA Region III Office of Analytical Services and Quality Assurance Branch
OLEM	Office of Land and Emergency Management
OSWER	Office of Solid Waste and Emergency Response
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
pdf	portable document file format
PPE	personal protection equipment
ppm	parts per million
PVC	polyvinyl chloride
QA	quality assurance
QC	quality control
RSL	Regional Screening Level
SEC	Shaffer Equipment Company

SOP	Standard Operating Procedure
SOW	Statement of Work
START	Eastern Area Superfund Technical Assessment and Response Team
SVOC	semivolatile organic compound
TAL	Target Analyte List
TDD	Technical Direction Document
UFP-QAPP	Uniform Federal Policy-Quality Assurance Project Plan
VOA	volatile organic analysis
VOC	volatile organic compound
WV	West Virginia
WVDNR	West Virginia Department of Natural Resources
WESTON®	Weston Solutions, Inc.

1.0 INTRODUCTION

Under the Eastern Area Superfund Technical Assessment and Response Team (START) Contract No. EP-S3-15-02, Technical Direction Document (TDD) No. W503-17-12-001, the U.S. Environmental Protection Agency (EPA) Region III tasked Weston Solutions, Inc. (WESTON®) to conduct sediment and soil sampling at the Shaffer Equipment Company Site (the Site) located in Minden, Fayette County, West Virginia (WV). For the purpose of this sampling, the Site consists of the former Shaffer Equipment Co. (SEC) property and any area where hazardous substances (i.e., polychlorinated biphenyl [PCB]-contaminated soil) are located, such as residential properties and Arbuckle Creek.

The purpose of this sampling is to collect sufficient information concerning conditions at the Site to assess the relative threat posed to human health and the environment concerning actual or potential release of hazardous substances attributable to the Site and to determine the need for additional action under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) based on criteria set forth in EPA's Hazard Ranking System (HRS) Final Rule (EPA, 1990 and 2017a). The scope of this sampling includes the collection of surface soil and sediment samples from residential properties and areas identified by concerned residents located in the vicinity of the former SEC property, and along Arbuckle Creek downstream of the Site. For site assessment purposes, "a residential property" is considered a property currently occupied at the time of assessment; therefore, soil samples for this sampling event will be limited to properties that are occupied at the time of sampling.

The sampling strategy presented in this Field Sampling and Analysis Plan (FSP) emphasizes the collection of samples intended to meet analytical data requirements as presented in the *Guidance for Performing Site Inspections Under CERCLA* (EPA, 1992). WESTON developed the FSP in accordance with the provisions of the *EPA Region III START 5 Program-Wide Uniform Federal Policy-Quality Assurance Project Plan (UFP QAPP)* (WESTON, 2015a).

2.0 BACKGROUND

This section provides a description of the site location and a summary of previous investigation activities associated with the Site.

2.1 SITE LOCATION

The Site is located in Minden, Fayette County, WV, as shown on **Figure 1,** Site Location Map. The approximate geographic coordinates of the center of the former SEC property are 37.976479° north latitude and 81.126337° west longitude. The Site is located in a rural/residential area. As shown in **Figure 2**, Proposed Sampling Location Map, the former SEC property is bordered by Arbuckle Creek to the north, residential areas to the east/northeast and the west, and undeveloped woodlands to the south. Arbuckle Creek flows in an easterly direction through numerous residential properties for approximately 3 miles to its confluence with the New River.

2.2 SITE DESCRIPTION

Operations at the former SEC property included building electrical substations for the local coal mining industry. Currently, the property is unoccupied and encompasses approximately 5 acres of land. A portion of the property has been capped with an impervious compact clay barrier/cap. Abandoned mine shafts and dilapidated structures are also present on the property. The SEC property is unsecured and evidence of recreational use, such as remnants of a campfire, discarded trash, and all-terrain vehicle (ATV) trails, have been found throughout the Site (TechLaw, 2017).

2.3 SITE HISTORY AND PREVIOUS INVESTIGATIONS

From 1970 to 1984, SEC occupied the property and constructed substations that incorporated various types of transformers, capacitors, switches, and related voltage regulation and distribution devices. As previously stated, Arbuckle Creek borders the SEC property to the north and receives surface water runoff from the property. The portion of Arbuckle Creek in the vicinity of the SEC property is prone to frequent flooding. In the summer of 1984, prior to the discovery of PCB contamination on the property, the creek was dredged as part of flood control efforts. The dredged material was placed along the creek banks, including portions on residential properties, to form berms for flood control and to be used as backfill in the residential yards to restore grade (NUS, 1991).

In September 1984, West Virginia Department of Natural Resources (WVDNR) conducted an inspection of the property and observed several hundred transformers and capacitors being stored therein. WVDNR collected a composite surface soil sample from the property and a grab soil/sediment

sample from a site drainage ditch that flowed into Arbuckle Creek. Results of the samples indicated PCB concentrations of 26,479 parts per million (ppm) and 1,136 ppm, respectively (EPA, 1987).

Between November 1984 and February 1985, EPA conducted a series of sampling events at the Site that identified concentrations of PCBs as high as 260,000 ppm in the surface soil on the SEC property, as high as 200 ppm in sediment from Arbuckle Creek, and as high as 15 ppm in soil from residential yards along Arbuckle Creek up to one mile downstream from the SEC property. Between December 1984 and December 1987, EPA completed a removal action at the SEC property that consisted of the excavation and offsite disposal of approximately 4,735 tons of PCB-contaminated soil and the removal and offsite disposal of 23 drums of capacitors, 24 drums of transformer fluid, 32 drums of transformer flush, 31 transformers, 50 drums of solids, 4 drums of coagulant, and 9 drums of PCB-contaminated liquid. Surface soil was removed from an approximate 1.6-acre area. The depth of the soil excavation ranged from 6 inches to 2 feet below ground surface (bgs). Post-excavation sample analysis indicated PCB concentrations less than 50 ppm in remaining soil on the property. Excavated areas were backfilled (EPA, 1987).

In March, May, and June 1990, EPA collected additional soil samples from the former SEC property and nearby residential properties. Analytical results indicated concentrations of PCBs as high as 40,303 ppm on the former SEC property and PCB concentrations of 0.9 ppm and 2.1 ppm on nearby residential properties. Surface water and sediment samples collected from Arbuckle Creek were non-detect for PCBs with the exception of one sample that contained 5.2 ppm PCBs (NUS Corporation, 1990 and International Consultants Inc. [ICI], 2003). In November 1990, EPA conducted a second removal action and excavated soil from six areas (Areas III, IV, V, VI, VII, and VIII) on the former SEC property. The final depths of excavation in the six areas ranged from 6 inches bgs to 4 feet bgs. The excavated soil was stored on the property temporarily before being transported offsite for disposal. The excavated areas were backfilled with soil from a borrow area south of the SEC facility. The backfilled excavations were sampled and PCB concentrations ranged from 0.1 to 1,000 ppm (ICI, 2003).

In October 1993, EPA collected 113 soil samples from the SEC property and nearby residential properties. Three samples were collected from an area on the SEC property identified by concerned citizens as the location of an alleged pit used for the disposal of PCB-contaminated oil and debris.

All the samples were field-screened for PCBs. Thirteen of the samples were submitted for laboratory analysis. The field screening identified 11 samples with PCB levels greater than 50 ppm and 11 samples with PCBs between 10 and 50 ppm. The remaining samples indicated PCB levels less than 10 ppm, including the three samples collected in the alleged pit disposal area. Of the nine samples collected from the residential properties, eight were indicated to contain PCBs less than 10 ppm and one sample indicated 10-50 ppm with a corresponding laboratory result of 18.2 ppm. Thirty-five sediment samples from Arbuckle Creek were also collected and field-screened. The sediment field screening indicated PCBs greater than 50 ppm in five samples and between 10 and 50 ppm in six samples. The remaining samples indicated PCBs less than 10 ppm. Laboratory results for six sediment samples ranged from non-detect (in the background sample) to 20.2 ppm. Split samples submitted to a WVDEP laboratory indicated PCB concentrations significantly less than shown in the data provided by EPA (WESTON, 1994).

Additional sampling was conducted at the Site in 1994 and in 1997 (ICI, 2003). Reports detailing the specific sampling locations and analytical results were not available for review at the time this FSP was drafted.

Between October 2001 and December 2002, EPA conducted a third removal action at the Site. During the third removal action, approximately 1 acre of the former SEC property that contained PCB-contaminated soil was capped with an impervious compact clay barrier (ICI, 2003).

In June and December 2017, EPA conducted a removal site evaluation that involved the collection of surface soil from the former SEC property and nearby residential properties, subsurface soil from the former SEC property, sediment and surface water samples from Arbuckle Creek, and groundwater samples from monitoring wells located on the former SEC property. One soil sample collected near an excavated area on the former SEC property contained 54 ppm of PCBs. Samples collected from residential properties ranged from non-detect to 1.3 ppm of PCBs. PCBs were detected in the majority of the sediment samples collected from Arbuckle Creek, ranging from 0.032 ppm to as high as 50 ppm. The maximum concentration detected from Arbuckle Creek was found at approximately 0.5 mile downstream of the former SEC property.

EPA continues to collect surface soil and sediment samples in Arbuckle Creek and surrounding areas to determine the extent of PCB contamination in Minden, WV.

3.0 OBJECTIVE AND DATA USE

The objective of this sampling event is to further characterize areas of contamination in Minden, WV, by collecting surface soil samples from areas identified by local residents as having potential contamination. Additionally, surface soil samples will be collected from residential properties located in the vicinity of the former SEC property and along Arbuckle Creek downstream and sediment samples will be collected from Arbuckle Creek to further determine extent of contamination. Surface soil sample analytical data will be compared to EPA Regional Screening Levels for Chemical Contaminants at Superfund Sites (RSLs) for residential and industrial soil (EPA, 2017b). Sediment sample analytical data will be compared against data from sediment samples collected upstream of the former SEC property.

4.0 PROPOSED ACTIVITIES

This section describes the scope of work, including proposed sampling activities and field measurements; a summary of samples for the project; explanations of how samples will be collected and handled; and descriptions of equipment decontamination procedures and the disposal of investigation-derived waste (IDW) that will be generated during sampling.

4.1 SCOPE OF WORK

As part of the assessment for the Site, WESTON will perform the following tasks:

- Collect up to 70 sediment/soil samples, including three field duplicate samples.
- Collect one groundwater sample, including one field duplicate.
- Document and record sample locations using Global Positioning System (GPS) technology and enter sample location information into a Scribe® database.
- Photo document sampling activities and sampling locations.

- Package and ship all samples collected to the assigned EPA Contract Laboratory Program (CLP) laboratory for analysis of PCBs, TAL metals, polycyclic aromatic hydrocarbons (PAHs) (by SIM [selected ion monitoring]), pesticides, and semivolatile organic compounds (SVOCs).

4.2 SAMPLE COLLECTION

This section describes the proposed sampling activities and general locations for each sample to be collected as part of field activities. Table 1 provides a description of proposed samples and sample locations and Table 2 summarizes the matrices, analyses, analytical methods, containers, preservatives, detection limits, and technical holding times for all the samples proposed to be collected during the sampling event.

4.2.1 SURFACE SOIL AND SEDIMENT SAMPLING

WESTON will collect up to 70 sediment/soil samples, including three field duplicate samples. Samples collected from residential properties will be collected within 200 feet of the occupied residence. Specific sample locations and residential properties will be determined in the field and based on property access. Up to five sediment samples will be collected from Arbuckle Creek adjacent to and downstream of the former SEC property and two samples will be collected upstream of the Site to provide background data. WESTON will collect surface soil and sediment samples in accordance with WESTON's Standard Operating Procedure (SOP) No. 302, Surface Soil Sampling (WESTON, 2015b) and SOP No. 303, Sediment Sampling (WESTON, 2015c). Samples will be collected from a depth of 0 to 6 inches bgs from each location, with the exception of samples collected at the Needleseye location. Due to approximately 2 feet of backfill present at Needleseye, soil samples will be collected at a depth of approximately 2-4 feet bgs utilizing a hand auger and dedicated stainless steel auger head. Soil/sediment will be collected using a dedicated polyethylene scoop. Prior to sampling, any vegetation or debris will be removed and the soil will be loosened in preparation for sample collection. Soil will first be placed into an aluminum pan, and all sticks, leaves, and stones will be removed. The soil in the aluminum pan will be thoroughly homogenized prior to being placed into appropriate sample containers for analysis. One sediment sample will require the use of a dedicated stainless-steel ponar dredge for collection. This sampling location is believed to part of an abandoned mineshaft on a property adjacent

to the Shaffer Equipment Site. The sediment is approximately 20 feet bgs and only accessible through a narrow hole in the ground.

4.2.2 GROUNDWATER SAMPLING

One aqueous sample will be collected during this sampling event in accordance with WESTON SOP No. 201, Groundwater Well Sampling (WESTON, 2011). The sample will be collected using a dedicated polyvinyl chloride (PVC) bailer and nylon rope and emptied directly into the appropriate bottleware. This sample will be collected from the abandoned mineshaft on property adjacent to the Shaffer Equipment Site. The groundwater is approximately 3 feet bgs and accessible through a small hole in the ground.

4.3 SAMPLE IDENTIFICATION

The Sample Identifier will be listed on the chain-of-custody document for each sample and will provide the date and sample location as follows:

SEC- XX-###

The "SEC" prefix refers to the Site name (Shaffer Equipment Co). The XX portion of the Sample Identifier refers to the sample type ("SS" for surface soil, "SD" for sediment, "GW" for groundwater) The "###" portion of the suffix refers to the unique sequential sample number assigned to a specific sampling location.

In addition to the Sample Identifier, samples to be shipped to CLP laboratories for analysis will be assigned unique CLP sample numbers. Organic samples will be identified in the format C#### (where the # may represent a number or letter) and inorganic samples will be identified in the format MC####. The CLP sample number and the Sample Identifier will be included on the chain-of-custody, the bottle labels, and the sample tags attached to each bottle.

4.4 SAMPLE MANAGEMENT

WESTON will document field activities using logbooks, photographic records, and chain-of-custody documentation. Documentation, recordkeeping, and data management activities will be conducted in

accordance with the WESTON UFP-QAPP (WESTON, 2015a) and the *Sampler's Guide: Contract Laboratory Program Guidance for Field Samplers* (EPA, 2014), unless otherwise specified. Each sampling location will be noted in the field logbook in accordance with WESTON SOP No. 101, Logbook Documentation (WESTON, 2015d). Scribe software will be used for sample documentation and data management.

Sample handling, packaging, and shipment procedures will be in accordance with the *Sampler's Guide: Contract Laboratory Program Guidance for Field Samplers* (EPA, 2014) for samples shipped to the CLP laboratory. Sample labels and tags will be affixed to each sample jar shipped to the CLP laboratory. Samples will be placed in plastic zipper bags. Bagged containers will be placed in coolers with ice and packed with appropriate absorbent material. All sample documents will be sealed in a plastic zipper bag and affixed to the underside of each cooler lid. The lid will be sealed with shipping tape and custody seals will be affixed to the cooler. Coolers will be labeled with their origin and destination locations.

Chain-of-custody documents will be completed using Scribe software and will accompany field samples to the laboratory in accordance with WESTON SOP No. 103, Chain-of-Custody Documentation (WESTON, 2016a). Samples will be shipped to the designated CLP laboratories via Federal Express. Regulations for packaging, marking, labeling, and shipping hazardous materials and wastes are promulgated by the U.S. Department of Transportation. Air carriers that transport hazardous materials require compliance with the current International Air Transport Association (IATA) regulations, which apply to shipment and transport of hazardous materials by air carrier. WESTON will follow all applicable IATA regulations.

4.5 DECONTAMINATION AND INVESTIGATION-DERIVED WASTE

Dedicated, disposable sampling equipment and personal protection equipment (PPE) will be used wherever applicable. Disposable sampling equipment and PPE will be double-bagged and disposed of as dry industrial waste. IDW is defined as any byproduct of the field activities that is suspected or known to be contaminated with hazardous substances. IDW will be handled in accordance with Office of Land and Emergency Management (OLEM), formerly titled Office of Solid Waste and Emergency

Response (OSWER) 9345.3-02 and WESTON SOP No. 019, Investigative Derived Waste Compliance Plan (WESTON, 2016b).

5.0 ANALYTICAL PARAMETERS AND METHODS

Samples will be analyzed for Target Analyte List (TAL) PCBs, Metals, PAHs (by SIM), pesticides, and SVOCs in accordance with EPA CLP Statement of Work (SOW) SOM02.4 for organics and EPA CLP SOW ISM02.4 for inorganics (EPA, 2016a and EPA, 2016b). Table 2, Analytical Parameters, summarizes the matrices, analyses, analytical methods, containers, preservatives, quality assurance/quality control (QA/QC) samples, and technical holding times for the samples proposed for collection during the sampling event.

6.0 QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

This section describes the QA and QC procedures for personnel during the site sampling event, including responsibilities, field QC, laboratory QC, data evaluation, and data management.

6.1 FIELD QUALITY CONTROL

Field QA/QC measures will consist of collecting field duplicates and, if needed, equipment rinsate blank samples. Rinsate blank samples will only be required if non-dedicated equipment is used to collect the sample. These measures will be applied in accordance with the WESTON EPA Region III START 5 Program-Wide UFP QAPP (WESTON, 2015a). The number and types of QC samples to be collected are summarized in Table 2.

Field duplicate samples will be collected at a rate of one per 20 samples per sample matrix and will be used to test the reproducibility of sampling procedures and analytical results.

Temperature blanks will be placed in each sample cooler and will be used to determine whether samples have been adequately cooled during shipment and storage. The temperature blank will be prepared using tap water placed in a VOA vial without preservative.

6.2 LABORATORY QUALITY CONTROL

Samples will be shipped to the CLP laboratory assigned through the EPA Region III Office of Analytical Services and Quality Assurance Branch (OASQA). Laboratory QC measures will consist of all QC elements identified in the analytical method or CLP Statement of Work (SOW) as required by EPA Region III policy, and will incorporate all reportable QC (including forms and deliverables) required by the SOW and this FSP.

For samples that are shipped to an EPA CLP laboratory, analysis of a matrix spike/matrix spike duplicate (MS/MSD) samples is required for pesticides and PCBs. MS/MSD sample results are used to assess analytical precision and accuracy in a specific sample matrix. WESTON field personnel will designate a minimum of one MS/MSD sample per 20 samples of the same matrix. Triple volume will be required for the groundwater MS/MSD for pesticides and PCBs. For soil samples, one additional jar will be provided as additional sample volume for pesticide and PCB MS/MSD analyses. See Table 2, Analytical Parameters, for a summary of QA/QC samples being collected.

6.3 DATA VALIDATION

Validation of all analytical data will be performed by the Environmental Services Assistance Team (ESAT) contractor under the direction of the OASQA Branch. Organic data will be validated at the Organic Level 2 level in accordance with USEPA *Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review (SOM02.4)*, USEPA-540-R-2017-002 (EPA, 2017c). Inorganic data will be validated at the Inorganic Level 2 in accordance with USEPA *Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Methods Data Review (ISM02.4),* USEPA-540-R-2017-001 (EPA, 2017d).

6.4 DATA EVALUATION AND MANAGEMENT

This section describes how WESTON will evaluate data generated from the sampling event, determine whether data are representative of the Site, and make certain that data are secure and retrievable.

6.4.1 DATA EVALUATION

WESTON will review the data validation reports to determine whether any major or minor deficiencies were encountered during sampling and analysis. These deficiencies may include major deficiencies (such as unusable or rejected data) or minor deficiencies affecting data, such as data that were estimated or qualified due to failure to meet project-specific or National Functional Guideline QC acceptance limits.

To assess the effectiveness of field sampling procedures and implement corrective actions as needed, WESTON will evaluate field blank results and other factors. For instance, failure of the temperature blank to meet the temperature acceptance criteria indicates the need to better ice down the samples.

6.4.2 DATA REPRESENTATIVENESS AND COMPLETENESS

The intent of this FSP is to obtain a complete data set, which represents site conditions. If sampling activities or procedures vary significantly from this FSP due to unexpected conditions in the field or other unforeseeable factors, WESTON will discuss these deviations from the FSP and whether the changes are expected to affect data representativeness in the Trip Report. Following the sampling activities, data will be reviewed for completeness. If not all samples were collected, resulting in less than 100% completeness, the reason for the data gaps will be identified in the Trip Report. If any data are rejected, the reason for the data rejection will also be discussed in the Trip Report.

6.4.3 DATA MANAGEMENT

EPA Region III will provide WESTON with a validation report for the analytical data in portable document file (pdf) format along with an importable Excel electronic data deliverable (EDD). WESTON will upload the EDD data to the Scribe database and compare the EDD results to the sample results received in pdf format in conjunction with the data validation report to ensure their consistency. All electronic data will be stored in a Scribe database for future retrieval and reference, based on the Work Assignment Manager's requirements.

7.0 SCHEDULE AND DELIVERABLES

WESTON anticipates that sample collection will take place the week of June 25, 2018. Following sample collection, samples will be shipped to the assigned laboratory for analysis. WESTON will request a 7-day turnaround time for unvalidated data and a 14-day turnaround time for validated data for sediment samples collected for PCB analysis from Arbuckle Creek. WESTON will request a 21-day turnaround time for unvalidated data for the remaining samples. WESTON expects to receive validated analytical data for the remaining samples from EPA Region III approximately 35 days after the laboratory receives the samples. WESTON will provide EPA with a Trip Report within 14 days after all site activities have been completed and validated data are available. The Trip Report will provide a discussion of data collection methods, and document sampling locations, and include data summary tables, figures, maps, and site photographic documentation.

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FIGURES

TABLES

Table 1 Proposed Sample Summary

Sample Identifier	Sample Matrix	Sampling Location Description	Analyses	Turnaround Time
SEC-SD-71	Sediment	Background 1; Arbuckle Creek upstream of Shaffer Site	PCBs	7 days
SEC-SD-72	Sediment	Background 2; Arbuckle Creek upstream of Shaffer Site	PCBs	7 days
SEC-SD-73	Sediment	AC-1; Arbuckle Creek adjacent/downstream from Site	PCBs	7 days
SEC-SD-74	Sediment	AC-2; Arbuckle Creek adjacent/downstream from Site	PCBs	7 days
SEC-SD-75	Sediment	AC-3; Arbuckle Creek adjacent/downstream from Site	PCBs	7 days
SEC-SD-76	Sediment	AC-4; Arbuckle Creek adjacent/downstream from Site	PCBs	7 days
SEC-SD-77	Sediment	AC-5; Arbuckle Creek adjacent/downstream from Site	PCBs	7 days
SEC-SD-78	Sediment	Duplicate of SEC-SD-77	PCBs	7 days
SEC-SD-79	Sediment	Portal 1 Runoff creek; Collect sample from small drainage creek	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SD-80	Sediment	Portal 1 Runoff creek; Collect sample from small drainage creek	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SD-81	Sediment	Mine 2 Outfall East; collect sediment from east side of outfall	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SD-82	Sediment	Mine 2 Outfall West; collect sediment from west side of outfall	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SD-83	Sediment	Portal 3 Mine Drainage; Collect sample from drainage ditch	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SD-84	Sediment	Portal 3 Mine Drainage; Collect sample from drainage ditch	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SD-85	Sediment	Portal 3 Sediment; Collect sample from drainage ditch	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SD-86	Sediment	Sheen Location; Collect sample around sheen	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SD-87	Sediment	Duplicate of SEC-SD-86	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SD-88	Sediment	Barrel Storage; Collect sample from drainage ditch	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SD-89	Sediment	Barrel Storage; Collect sample from property around suspected area	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SD-90	Sediment	Mine Water Discharge; Collect sample upstream of discharge point	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SD-91	Sediment	Mine Water Discharge; Collect sample downstream of discharge point	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SD-92	Sediment	Mine Water Discharge; Collect sample from wall of mine	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SD-93	Sediment	Mine Drainage; Mine runoff from the hill, sheen	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SD-94	Sediment	Mine Drainage 2; Mine runoff from the hill, sheen	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days

Sample Identifier	Sample Matrix	Sampling Location Description	Analyses	Turnaround Time
SEC-SD-95	Sediment	Res-1; Collect sample from creek of residence	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SD-96	Sediment	Mary Lane; Collect sample from wet area outside residence, sheen	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SD-97	Sediment	Res-4; Collect sample from Arbuckle creek at residence	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SD-98	Sediment	Mine Hole; Collect sediment from bottom of hole; ponar dredge	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SD-99	Sediment	Res-2; Collect sample from drainage ditch	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SD-100	Sediment	Res-2; Collect sample from drainage ditch	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-212	Soil	Res-1; Collect sample from back of property	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-213	Soil	Res-2; Collect sample in the suspected dump area in the middle of the two sheds and house	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-214	Soil	Res-2; Collect sample in the suspected dump area in the middle of the two sheds and house	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-215	Soil	Res-2; Collect sample in the suspected dump area in the middle of the two sheds and house	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-216	Soil	Res-3; Collect sample from inside fence, corner of residence	PCBs	21 days
SEC-SS-217	Soil	Res-5; Collect sample from back side yard	PCBs	21 days
SEC-SS-218	Soil	Res-6; Collect sample from yard, North side	PCBs	21 days
SEC-SS-219	Soil	Res-6; Collect sample from yard, East side	PCBs	21 days
SEC-SS-220	Soil	Res-7; Collect sample from yard	PCBs	21 days
SEC-SS-221	Soil	Res-8; Collect sample from yard	PCBs	21 days
SEC-SS-222	Soil	Res-9; Collect sample from yard	PCBs	21 days
SEC-SS-223	Soil	Res-10; Collect sample from yard	PCBs	21 days
SEC-SS-224	Soil	Post Office; Collect sample from yard	PCBs	21 days
SEC-SS-225	Soil	Needle eye/Slate dump	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-226	Soil	Needle eye/Slate dump	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-227	Soil	Needle eye/Slate dump	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-228	Soil	Needle eye/Slate dump	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-229	Soil	Needle eye/Slate dump	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-230	Soil	Needle eye/Slate dump	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-231	Soil	Needle eye/Slate dump	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-232	Soil	5 Hump	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-233	Soil	Duplicate of SEC-SS-231	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days

Sample Identifier	Sample Matrix	Sampling Location Description	Analyses	Turnaround Time
SEC-SS-234	Soil	UST Discovered	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-235	Soil	UST Discovered	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-236	Soil	Tipple; collect sample from where old storage tank location	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-237	Soil	Access Point - Powerhouse; sample around dumping hole	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-238	Soil	Access Point - Powerhouse; sample around dumping hole	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-239	Soil	Access Point - Powerhouse; sample around dumping hole	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-240	Soil	Mine Discharge Pipe; Collect samples from below the discharge pipe	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-241	Soil	Mine Discharge Pipe; Collect samples from above the discharge pipe on mound	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-242	Soil	Water Tower Access	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-243	Soil	Mary Lane 2; Collect sample from beneath home	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-244	Soil	Mine Hole; Collect soil around hole	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-245	Soil	Duplicate of SEC-SS-242	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-246	Soil	Vacant Lot 1	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-247	Soil	Vacant Lot 2	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-248	Soil	Vacant Lot 3	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-SS-249	Soil	Vacant Lot 4	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-GW-01	Groundwater	Mine Hole; Collect water from hole; bailer	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days
SEC-GW-02	Groundwater	Duplicate of SEC-GW-01	PCBs, TAL Metals, TAL PAHs (SIM), Pesticides, SVOCs	21 days

AC = Arbuckle Creek
GW = groundwater
PAH = Polycyclic Aromatic Hydrocarbon
PCB = polychlorinated biphenyl
Res = Residence
SEC = Shaffer Equipment Company
SD = sediment
SIM = Selected Ion Monitoring
SS = surface soil
SVOC = semivolatile organic compound
TAL = Target analyte list
UST = Underground storage tank

Table 2 Analytical Parameters

Matrix	Parameter	Analytical Method	Container Type	Preservative	Detection Limit	Technical Holding Time	No. of Field Samples	No. of Field Duplicates	No. of Lab QC Samples[1]	No. of Rinsate Blanks	No. of Trip Blanks	Total No. of Samples
Groundwater and Rinsate Blanks	SVOCs	SOM02.4	Two 1-L amber	Ice	CRQL	7 days (extraction) 40 days (analysis)	1	1	0	0	0	2
	PAHs by SIM	SOM02.4	Two 1-L amber	Ice	CRQL	7 days (extraction) 40 days (analysis)	1	1	0	0	0	2
	PCBs	SOM02.4	Two 1-L amber	Ice	CRQL	7 days (extraction 40 days (analysis)	1	1	1 MS/MSD	0	0	2
	Pesticides	SOM02.4	Two 1-L amber	Ice	CRQL	7 days (extraction) 40 days (analysis)	1	1	1 MS/MSD	0	0	2
	TAL Metals	ISM02.4 ICP-MS	1-L HDPE	Ice, HNO_3 to pH <2	CRQL	180 days for metals	1	1	1 S/D	0	0	2
Sediment or Soil	SVOCs and PAHs by SIM	SOM02.4	One 8-oz CWM jar	Ice	CRQL	14 days (extraction) 40 days (analysis)	46	3	3	0	0	49
	PCBs only	SOM02.4	One 8-oz CWM jar	Ice	CRQL	14 days (extraction) 40 days (analysis)	16	1	1 MS/MSD	0	0	17
	PCBs and Pesticides	SOM02.4	One 8-oz CWM jar	Ice	CRQL	14 days (extraction) 40 days (analysis)	46	3	3 MS/MSD	0	0	49
	TAL Metals	ISM02.4 ICP-AES	One 8-oz CWM jar	Ice	CRQL	180 days for metals	46	3	3 S/D	0	0	49

Notes:

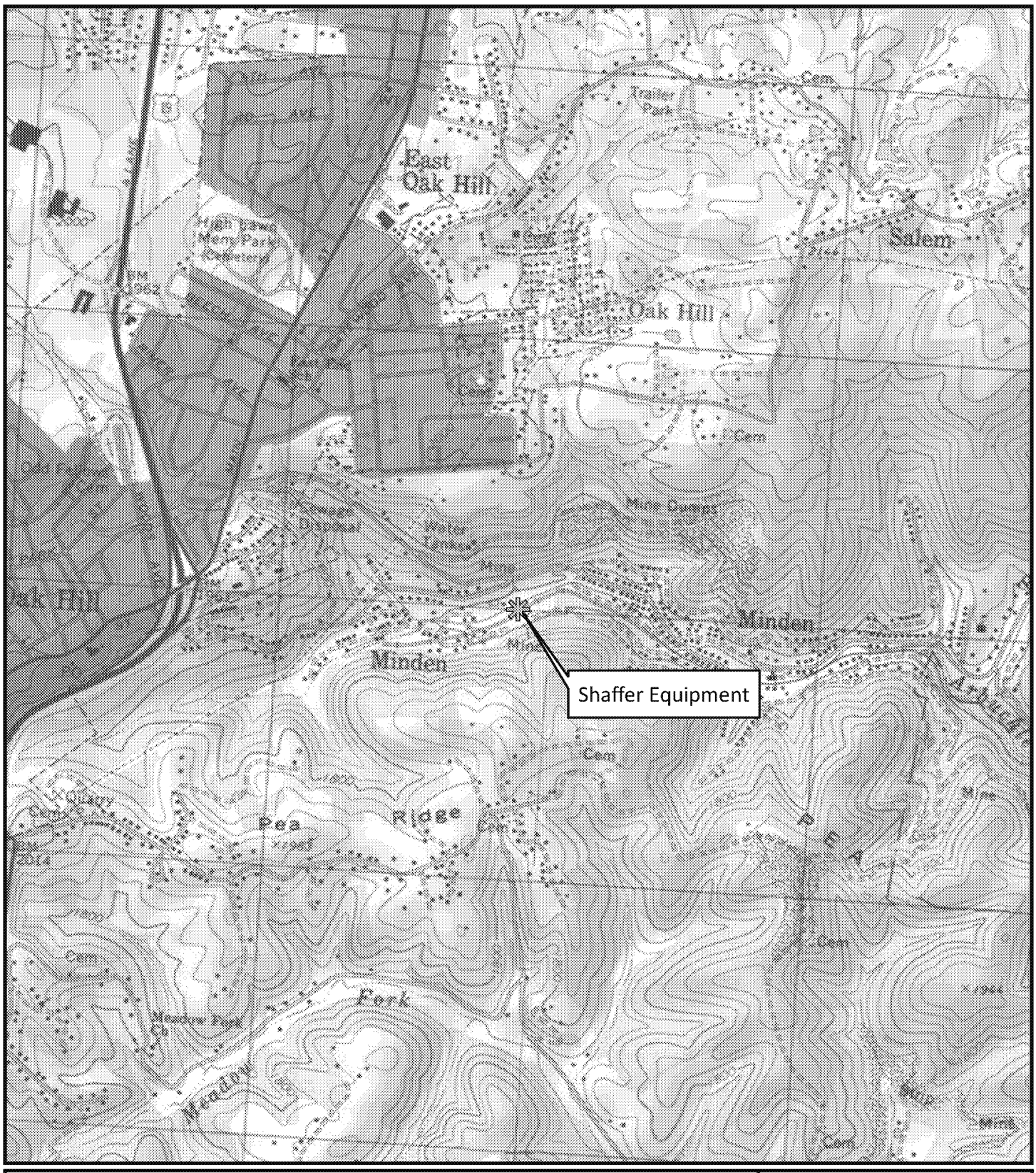
[1] Designate 1 sample per 20 samples for laboratory QC (i.e., MS/MSD for PCB and pesticide analysis, S/D for inorganic analysis). A triple volume is required for the aqueous PCB and pesticide sample designated for MS/MSD analysis. A double volume is required for the aqueous inorganic sample designated for S/D analysis. Two 8-oz jars are required for soil/sediment samples designated as QC samples.

CLP = Contract Laboratory Program
CRQL = Contract-required quantitation limit
CWM = clear wide-mouthed
HDPE = high-density polyethylene
HNO_3 = Nitric acid
ICP-MS = Inductively coupled plasma – mass spectrometry

ISM02.4 = CLP SOW Inorganic Superfund Method

L = Liter
mL = Milliliter
MS/MSD = matrix spike/matrix spike duplicate
NA = Not Applicable
oz = ounce
PCB = Polychlorinated biphenyl
PAH = polycyclic aromatic hydrocarbon
QC = Quality control
S/D = matrix spike/duplicate
SIM = Selected Ion Monitoring

SOM02.4 = CLP SOW Superfund Organic Method
SOP = Standard Operating Procedure
SOW = Statement of work
SVOC = Semivolatile organic compound
TAL = Target analyte list



USGS 7.5 Minute Quadrangle
Oakhill, West Virginia, 1976. Revised 1978
Thurmond, West Virginia, 1976. Revised 1977

N

Coordinate System:
WGS84 UTM Zone 17N Feet

0 1,000 2,000
Feet

Shaffer Equipment
Minden, Fayette County, West Virginia

Figure 1
Site Location Map

TDD#: W503-17-12-001
Contract: EP-S3-15-02
Prepared: 11/29/2017

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